

# **Applied Data Analysis**

**Winter 2017**

## **WHO SHOULD TAKE THIS COURSE?**

This course is designed for students who are interested in developing skills for working with data and using statistical tools to analyze them. No prior experience with data or statistics is required.

## **WHAT ELSE SHOULD YOU KNOW?**

The approach is “statistics in the service of questions”. As such, the research question that you choose (from data sets made available to you) is of paramount importance to your learning experience. It must interest you enough that you will be willing to spend many hours reading about it, thinking about it and analyzing data having to do with it.

The course will offer an intensive hands-on experience in the research process. You will develop skills in 1) generating testable hypotheses; 2) conducting a literature review; 3) understanding large data sets; 4) formatting and managing data; 5) conducting descriptive and inferential statistical tests; and 6) reporting and interpreting results.

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## **SCHEDULE**

<b>Before Class Meets:</b>	Course Introduction (1a) and Software (e-mail instructions) Data sets and code books (1b)
:	Data architecture (1b)
<b>Day 1 (Mon):</b>	Literature review (2a and 2b) Working with data (3a)
<b>Day 2 (Tues):</b>	Data management (3b) Graphing (5a and 5b)
<b>Day 3 (Wed):</b>	Hypothesis testing ANOVA, Chisq and Pearson (6a and 6b)
<b>OFF (Thur)</b>	<i>Continued out-of-class work on analyses and literature review</i>
<b>Day 4 (Friday):</b>	Hypothesis testing in the context of Moderation (7a)
<b>Day 5 (Sat):</b>	Multivariate analyses (8b and 9a)
<b>OFF (Sun)</b>	<i>Out-of-class work on poster</i>
<b>Day 6 (Mon):</b>	Poster making (10b)
<b>Day 7 (Tues):</b>	Final posters (due 5:00) and intro to decision trees.
<b>OFF (Wed)</b>	<i>Out of class work on presentations</i>
<b>Day 8 (Thur):</b>	Poster presentation and start work on take-home final exam.

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## **COURSE REQUIREMENTS**

**Class Sessions:** Class sessions include instructor, peer mentor and guest support aimed at helping you to make consistent and meaningful progress on your research project.

**Materials:** All supporting materials for the course will be made available through Schoology.com. You will need to set up an account and use the following access code to register and join the course **WF98Q-364QC**

**Lessons:** Rather than a traditional textbook, this course provides a series of "lessons" aimed at preparing students conceptually and technically for the various steps taken in completing their research project. Lessons are presented in video with corresponding text and content/demonstrations. **All assigned lessons should be completed prior to each class session.**

**Journal and Component Assignments:** Students will submit journal entries through Schoology each day. The purpose of the journal is to encourage you to reflect on the research process. You will be submitting two types of entries. 1) Following each set of lessons, you will be writing a reflection on how you will use each lesson in your own research (**To receive credit, these journal entries are due at the start of each class session**). 2) Component assignments will also be submitted as part of your journal entries as a way of building your story around results and next steps. (**To receive credit, these component assignments are due at the start of the class session following our work on the topic**).

**Research Poster/Oral Presentation:** Journal entries and assignments will build to the completion of an individual project that will be presented at the end of class as a research poster and oral presentation. The poster session will be scheduled on the last day of class for the course. A 5-minute oral presentation followed by a question and answer session is required of each student. All posters must be submitted for printing by 5:00 pm on Tuesday, January 17.

**Exams:** An on-line exam will be given during the class session and will include questions in objective format (i.e. multiple choice). You will be asked to apply your knowledge and integrate material from lessons and class experiences. The exam is "closed-book"; however, you are permitted to bring ONE standard 8.5x11 sheet of paper including anything that you think will help you in the exam (your notes may be written on both sides). A take home final exam will be given out at the end of the day on Thursday, Jan 19.

**Peer Mentors:**  
TBD

**Commitment to the Course:** Students are expected to make marked progress each day and to come to class sessions prepared with questions and planned next steps. It is important to note that to really learn the material and skills presented in this course, students will need to devote a substantial amount of time.

**Scientific Integrity:** The rules of science should be carefully upheld in everything that you do. The following behavior is absolutely unacceptable: Data fabrication, selective reporting, omission, suppression or distortion. Please be mindful that there is no such thing as a "little scientific misdemeanor".

**Grades: Course grades will be based on**

- a. Journal and component assignments (25%)
- b. Research Poster/Oral presentation (20%)
- c. In-class exam (25%)
- c. Take home final exam (20%)
- d. Positive, helpful, and curious attitude (we should be made better by you) (10%)

**Passing Letter Grades/Percentages:** A 95-100%; A- 91-94%; B+ 88-90%; B 85-87%; B- 81-84%; C+ 78-80%; C 75-77%; C- 71-74%; D+ 68-70%; D 65-67%; D- 60-64%